

3-phase meter with connection via CT pulse or Modbus RS485 output

Cat. No(s): 0 046 74 / 84



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1. DESCRIPTION - USAGE

Active and reactive energy meter.
Measures the electricity consumed by a single phase or 3-phase circuit using current transformers (CT) downstream of the power distribution metering.
Displays the power consumption in kWh and kvarh.

2. RANGE

- . Cat. No. 0 046 74: 4-module 3-phase pulse output meter (17.8 mm) self-powered on the measurement terminal.
- . Cat. No. 0 046 84: 4-module 3-phase RS485 and pulse output meter (17.8 mm) self-powered on the measurement terminal.

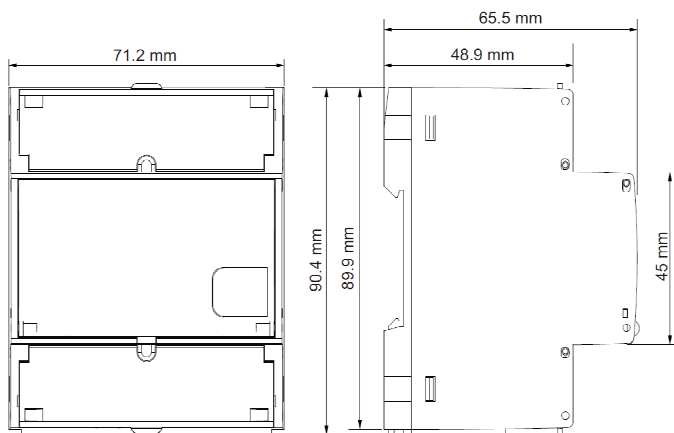
Nominal ratings:

- . Nominal rating: 5 A (per external current transformer x/5 A)
- . I_{max} maximum current: 6 A

Nominal voltage and frequency:

- . Un: 3 x 230 / 400 V~ ± 20%
 - 3 x 400 V~ ± 20%
 - 3 x 230 V~ ± 20%
- . Fn: 50-60 Hz ± 5%

3. DIMENSIONS



4. POSITIONING - CONNECTION

Mounting:

- . On IEC/EN 60715 symmetrical rail

Operating positions:

- . Vertical, horizontal, upside down, on the side



Terminals:

- . Terminal depth: 8 mm.
- . Recommended stripping length: 8 mm

Screw head :

- . Slotted head.

Recommended tightening torque:

- . 0.4 Nm.

Maximum tightening torque:

- . 0.8 Nm.

Tools required:

- . For the terminals: 3 mm flat screwdriver.
- . For attachment: 5.5 mm flat screwdriver (6 mm maximum).

Terminal capacity:

	Copper cable
Rigid cable	1 x 0.5 mm ² to 4 mm ²
Flexible cable	1 x 0.5 mm ² to 4 mm ²

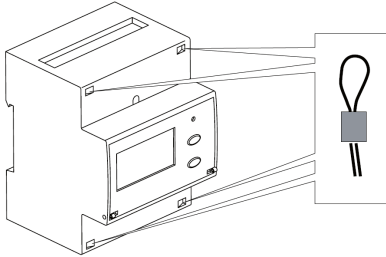
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4. POSITIONING – CONNECTION (continued)

Terminal protection:

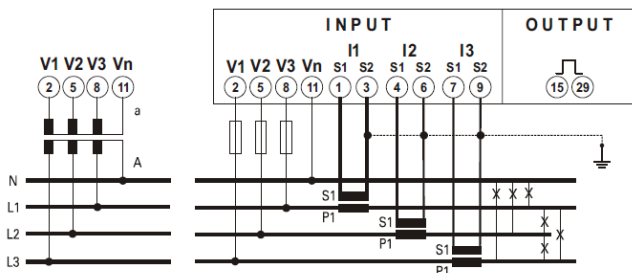
The power and communication terminals are protected with sealable terminal shields integrated in the product.



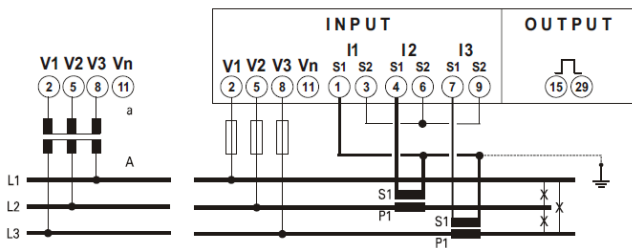
Electrical connection diagram:

Example for Cat. No. 046 74:

4-wire and three CT 3-phase mains supply:

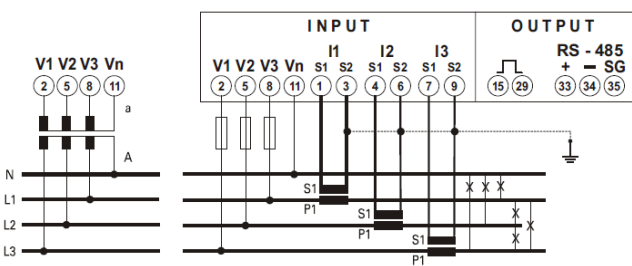


3-wire and two CT 3-phase mains supply:

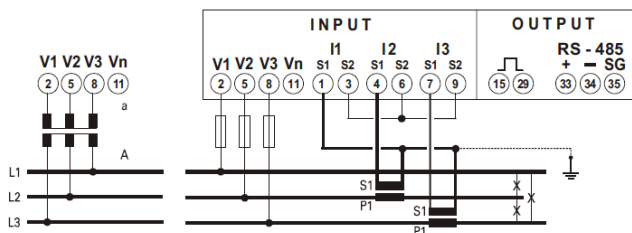


Example for Cat. No. 046 84:

4-wire and three CT 3-phase mains supply:



3-wire and two CT 3-phase mains supply:



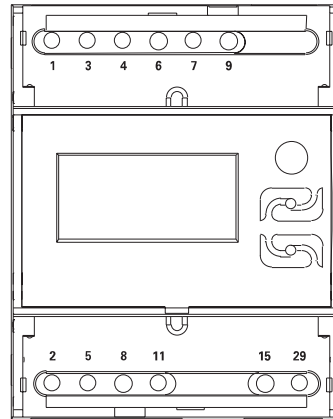
Please see the product instructions for all other configurations.

5. GENERAL CHARACTERISTICS

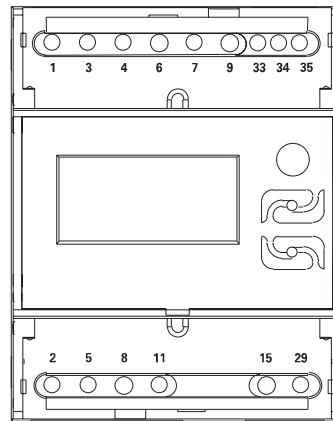
Marking on the device box:

By indelible pad printing:

046 74

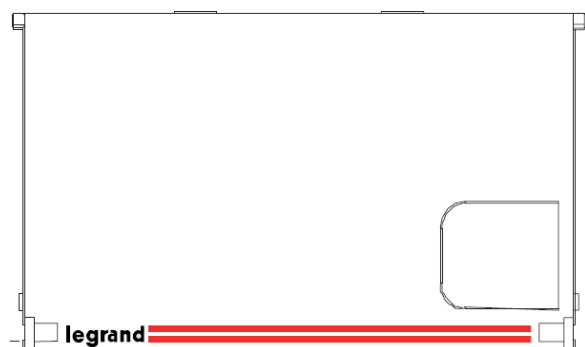


046 84



Front transparent marking:

By indelible pad printing:



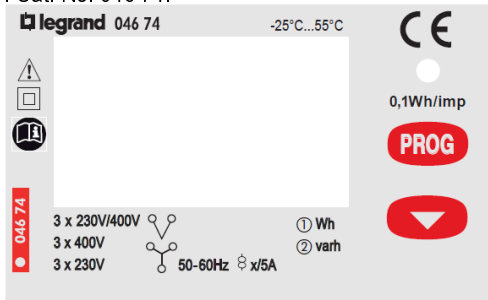
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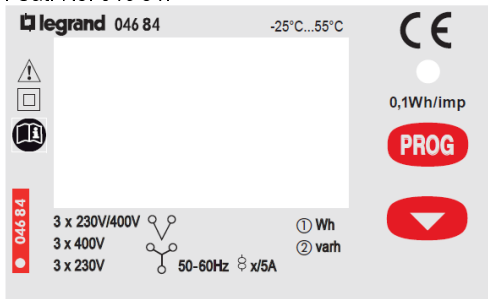
5. GENERAL CHARACTERISTICS *(continued)*

Marking on the front panel:

- . By adhesive label:
- . Cat. No. 046 74:



- . Cat. No. 046 84:



Display

Type: 8-digit LCD

Resolution: 0.01 kWh

Maximum indication: in accordance with the CT and PT transformation ratios (see table below)

$kCT^1 \times kPT^2$	Maximum display	Resolution
1 → 9.9	999 999.99 kWh/kvarh	10 Wh/varh
10 → 99.9	9 999 999.9 kWh/kvarh	100 Wh/varh
100 → 999.9	99 999 999 kWh/kvarh	1 kWh/kvarh
1000 → 9999.9	999 999.99 MWh/Mvarh	10 kWh/kvarh
→10000	9 999 999.9 MWh/Mvarh	100 kWh/kvah

¹ kCT = external CT transformation ratio
(e.g. 800 A / 5 A $kTA = 160$).

² kPT = external TT transformation ratio
(e.g. 600/100 V $kTV = 6$). for direct connection $kPT = 1$
In this example, $kCT \times kPT = 160 \times 6 = 960$.

- . Max Ct x Vt ratio that can be selected = 100,000 (CT = x/5A)
- . ATTENTION! for direct connection select Ct=0001 and Vt=0001.0

Meter start-up time:

- . t < 5 sec (in accordance with IEC 62053-21, IEC 62053-23).

Value and programming indicator

- . By pressing the front buttons (see the instructions).

Metrological LED:

- . Pulse weight: 0.1 Wh/imp

Display:

- . Total active energy
- . Total reactive energy
- . Partial active energy (reset to zero possible)
- . Partial reactive energy (reset to zero possible)
- . Maximum average active power (reset to zero possible)
- . Average active power
- . Menu: Current, Voltage, Power
- . Current L1, L2, L3
- . Phase-to-phase voltage L1-L2, L2-L3, L3-L1
- . Instantaneous active power
- . Instantaneous reactive power
- . Instantaneous apparent power
- . Frequency
- . Power factor

Programming menu

- . 046 84:
 - Password (1000 by default)
 - Connection type: mode A or mode B (see instructions)
 - CT transformation ratio
 - PT transformation ratio
 - Average power integration time (min): 5, 8, 10, 15, 20, 30, 60
 - Communication speed
 - Modbus address
 - Parity bit
 - Pulse output type
 - Pulse weight
 - Pulse duration
 - Password change
- . 046 74:
 - Password (1000 by default)
 - Connection type
 - CT transformation ratio
 - PT transformation ratio
 - Average power integration time (min): 5, 8, 10, 15, 20, 30, 60
 - Pulse output type
 - Pulse weight
 - Pulse duration
 - Password change

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5. GENERAL CHARACTERISTICS *(continued)*

RS485 output characteristics (Cat. No. 046 80):

- . Address: from 1 to 247
- . Communication speed: 2.4 - 4.8 - 9.6 - 19.2 Kbps
- . Parity bit: none, even, odd
- . Galvanically isolated output for the measurement inputs
- . RS 485 standard - 2 pairs of twisted wires
- . Modbus protocol
- . Query response time < 200 ms

Pulse output characteristics (Cat. No. 046 73):

- . SO according to EN62053-31, class A
- . U_{imp} voltage: max 115 V_{a.c./d.c.}
- . I_{imp} current: max 50 mA
- . Pulse weight: programmable; possible values: 10 - 100 - 1000 - 10 k - 100 k - 1000 k Wh/imp or varh/imp
- . Pulse duration: programmable; possible values: 50 - 100 - 150 - 200 - 300 - 400 - 500 ms.

Ambient operating temperature:

- . Min. = -25°C Max. = +55°C.

Storage ambient temperature:

- . Min. = -40°C Max. = +70°C.

Device protection:

- . Recommended fuse type ≤ 2 A gG

Protection rating:

- . Protection index for the terminals against solid objects and liquids: IP 20 (in accordance with standards IEC 529, EN 60529 and NF C 20-010).
- . Protection index for the enclosure against solid objects and liquids: IP 30 (in accordance with standards IEC 529, EN 60529 and NF C 20-010).

Protection class:

- . II

Degree of pollution:

- . 2

Overvoltage category:

- . III

Average weight per device:

- . 0.380 kg.

Packaged volume:

- . 0.58 dm³

Power consumption:

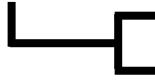
- . ≤ 4 VA.

Heat dissipation:

- . ≤ 4 W.

5. GENERAL CHARACTERISTICS

Glossary:

CodE	Password	
ModE A / ModE B	Configuration	
Ct	CT ratio	
Vt	PT ratio	
tIME	Integration time	
Addr	Communication address	
bAUd	Communication speed	
Par	Parity bit	
	nonE	None
	EVEn	Even
	odd	Odd
PLSt ACT	Active energy pulse output	
PLSt rEA	Reactive energy pulse output	
PLSU	Pulse weight	
PLSd	Pulse duration	
PASS	Password change	

6. COMPLIANCE

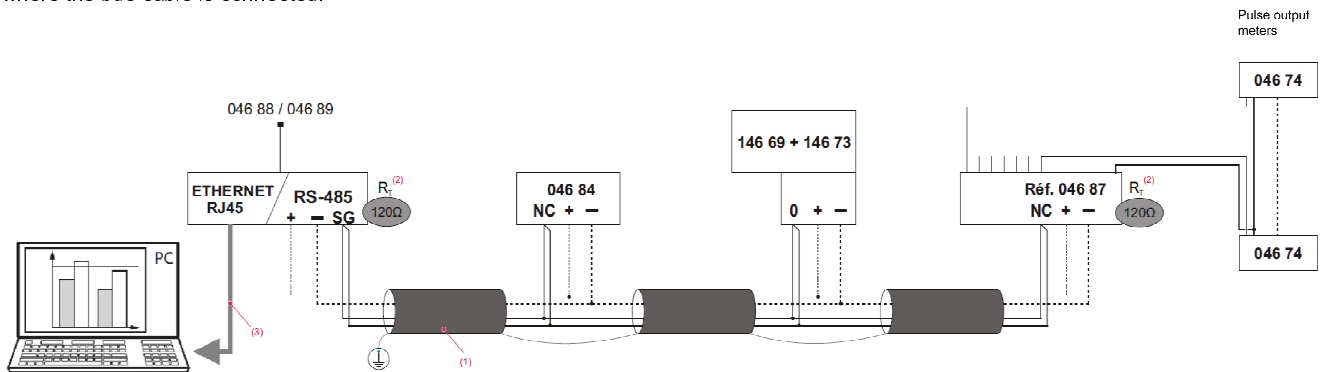
Compliance with standards:

- . Electromagnetic compatibility: IEC 62052-11
- . Measurement precision for the active energy: 1 (in accordance with IEC 62053-21).
- . Measurement precision for the active energy: 2 (in accordance with IEC 62053-23).

7. COMMUNICATION

Modbus connection system diagram:

. The R_T (120 Ω) termination resistors must be inserted on the first and last device connected to the RS485 bus in the same terminals (+, -) where the bus cable is connected.



⁽¹⁾ RS485: Belden 9842 Cable (or equivalent) used for a maximum bus length of 1000 m or Category 6 Cable (FTP or UTP) for a maximum length of 50 m;

⁽²⁾ Integrated R_T termination resistor;

⁽³⁾ Ethernet: Category 6 Cable (FTP or UTP);

The pulse meters must be connected to the pulse concentrator (Cat. No. 0 046 87) for integration in a monitoring / energy metering system